

Supplementary Material

1. Characterization of the gold complexes

[Au(2)Cl]Cl (2Au): Yield: >70%. m.p: 98-100 °C. $\Lambda_M = 129 \Omega^{-1}\text{cm}^2\text{mol}^{-1}$.
 $\text{C}_{24}\text{H}_{31}\text{N}_2\text{OCl}_2\text{Au}$: calcd. C: 45.65; H: 4.95; N: 4.44; Au: 31.20; found C: 45.20; H: 5.03; N: 4.04; Au: 32.09 %. IR (KBr, cm^{-1}): $\nu = 1610$ (C=N). $^1\text{H-NMR}$ (CDCl_3 , ppm): $\delta = 8.81$ -7.98 (6H, m, H_{arom}); 7.88-7.29 (4H, m, 3H_{arom} , CH=N); 5.23-5.17 (1H, m, CH_2Ph); 4.80-4.64 (1H, m, CH_2Ph); 2.31-2.22 (5H, m, CH_3 , H_4 , H_3'); 2.06-1.92 (1H, m, H_4'); 1.41-1.36 (9H, m, $\text{C}(\text{CH}_3)_3$). EM (m/z): 596 ($[(2)\text{AuCl}]^+$).

[Au(3)Cl]Cl (3Au): Yield: >70%. m.p: 130-132 °C. $\Lambda_M = 118 \Omega^{-1}\text{cm}^2\text{mol}^{-1}$.
 $\text{C}_{28}\text{H}_{33}\text{N}_2\text{OCl}_2\text{Au}$: calcd. C: 49.3; H: 4.9; N: 4.1; Au: 28.9. found C: 49.00; H: 5.03; N: 4.04; Au: 29.3 %. IR (KBr, cm^{-1}): $\nu = 1608$ (C=N). $^1\text{H-NMR}$ (CDCl_3 , ppm): $\delta = 8.27$ -8.10 (m, H_{arom}); 7.90-7.77 (m, H_{arom} , CH=N); 7.60-7.38 (m, H_{arom}); 7.12-7.02 (m, H_{arom}); 6.72-6.66 (m, H_{arom}); 5.20, 4.95 (d, $J_{\text{AB}} = 16$ Hz, $\text{CH}_{2\text{naphthyl}}$); 3.77-3.37 (m, $\text{H}_{5'a}$, CH=NCH₂); 3.22-2.76 (m, $\text{H}_{2'}$, CH=NCH₂); 2.17-2.05 (m, $\text{H}_{5'b}$, CH_3); 1.93-1.47 (m, $\text{H}_{3'a,b}$, $\text{H}_{4'a,b}$); 1.34-1.21 (s, $\text{C}(\text{CH}_3)_3$). EM (m/z): 646 ($[(3)\text{AuCl}]^+$).

[Au(4)Cl]Cl (4Au): Yield: >65 %. m.p.: 135-137 °C. $\Lambda_M = 117 \Omega^{-1}\text{cm}^2\text{mol}^{-1}$.
 $\text{C}_{28}\text{H}_{33}\text{N}_2\text{OCl}_2\text{Au}$: calcd. C: 49.3; H: 4.9; N: 4.1; Au: 28.9. found C: 48.90; H: 5.13; N: 4.64; Au: 29.6 %. IR (KBr, cm^{-1}): $\nu = 1615$ (C=N). $^1\text{H-NMR}$ (CDCl_3 , ppm): $\delta = 8.10$ -8.03 (m, H_{arom}); 8.00-7.96 (m, CH=N); 7.85-7.75 (m, 4H_{arom}); 7.50-7.38 (m, 2H_{arom}); 7.18-7.16 (m, H_{arom}); 7.07-7.02 (m, H_{arom}); 4.95, 4.26 (d, $J_{\text{AB}} = 13.8$ Hz, $\text{CH}_{2\text{naphthyl}}$); 3.60-3.37 (m, $\text{H}_{5'a}$, CHN=CH₂); 3.24-3.15 (m, CH=NCH₂); 2.83-2.71 (m, H_2); 2.58-

2.42 (m, H_{5'b}); 2.17-2.04 (s, CH₃); 1.97-1.83 (m, H_{3'a,b}, H_{4'a,b}); 1.40-1.25 (s, C(CH₃)₃).

EM (m/z): 646 ([**(4)**AuCl]⁺).

[Au(5)Cl]Cl (5Au): Black brown. Yield: 65%. M.p.: >230 °C. (C₃₂H₂₉N₂OCl₂Au): calcd.: C: 52.9; H: 4.0; N: 3.9; Au: 27.1. Found.: C: 52.6; H: 3.8; N: 3.7; Au: 26.9 %. IR (KBr, cm⁻¹): ν = 1615 (C=N). UV-vis: 482, 345, 328, 230. ¹H-RMN (CD₃Cl, ppm): δ = 7.89-6.37 (16H, m, 15H_{arom}, CH=N); 1.96 (3H, s, CH₃); 1.20 (9H, s, C(CH₃)₃). ¹³C-RMN (CD₃Cl, ppm): δ = 167.34 (C-O-Au); 156.00 (CH=N); 135.46, 134.96, 134.53, 133.52, 132.87, 132.35, 131.54, 131.32, 130.63 (C_{arom}); 35.22 (C(CH₃)₃); 30.04 (C(CH₃)₃); 20.00 (CH₃). EM (m/z): 655 ([**(5)**Au²⁺])

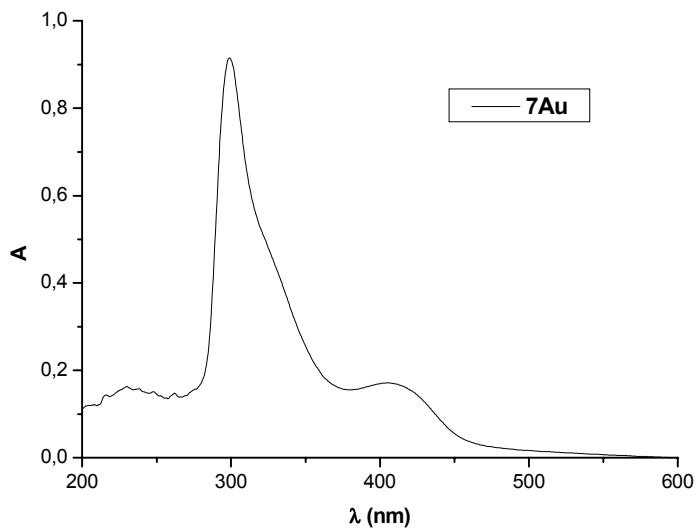
[Au(6)]Cl (6Au): Black. Yield: >60 %. m.p.: >230 °C. C₄₄H₄₂N₂O₂ClAu: calcd. 61.2; H: 4.9; N: 3.2; Au: 22.8. found C: 61.0; H: 4.6; N: 3.4; Au: 22.6 %. IR (KBr, cm⁻¹): ν = 1638 (C=N); 555 (Au-O). H-NMR (CDCl₃, ppm): δ = 8.01-7.15 (16H, m, H_{arom}); 2.00 (3H, s, CH₃); 1.25 (9H, s, C(CH₃)₃). ¹³C-RMN (CD₃OD, ppm): δ = 162.41 (C-O-Au); 159.98 (CH=N); 123.19, 119.35, 112.44 (C_{arom}); 29.72 (C(CH₃)₃); 20.34 (CH₃). EM (m/z): 654 ([M-Cl_{aldehyde}])

[Au(7)]Cl (7Au): Brick, Yield: >65 %. m.p.: > 200 °C. $\Lambda_M = 109 \Omega^{-1}\text{cm}^2\text{mol}^{-1}$. C₃₀H₄₀N₂O₂ClAu: calcd. 50.0; H: 5.8; N: 4.0; Au: 28.4. found C: 50.4; H: 5.4; N: 4.4; Au: 28.6 %. IR (KBr, cm⁻¹): ν = 1636 (C=N); 558 (Au-O). H-NMR (CDCl₃, ppm): δ = 8.40-8.17 (m, CH=N); 7.60-7.17 (4H, m, H_{arom}); 4.16-4.09 (m, CH₂N); 3.53-3.42 (m, CH₂N); 2.00 (3H, s, CH₃); 1.25 (9H, s, C(CH₃)₃). ¹³C-RMN (CD₃OD, ppm): δ = 167.41 (C-O-Au); 160.00 (CH=N); 139.97 (C_{arom}); 30.17 (C(CH₃)₃); 22.97 (CH₃). EM (m/z): 693 ([**(7)**AuCl]).

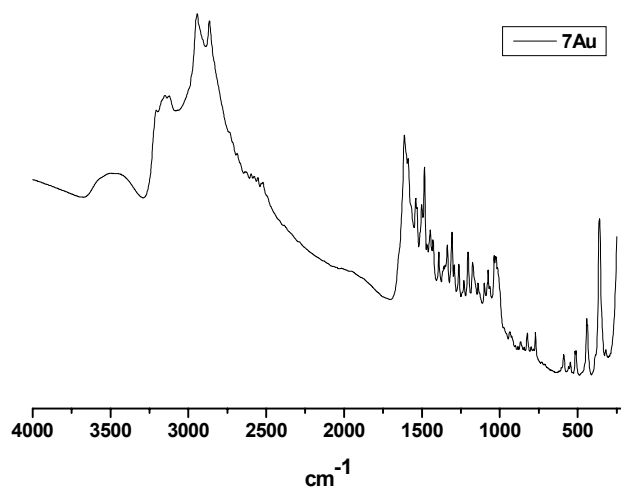
Supplemental Material

2. FTIR, DTTR and ^{13}C NMR spectra of 7Au-7Au-(MCM-41) catalyst.

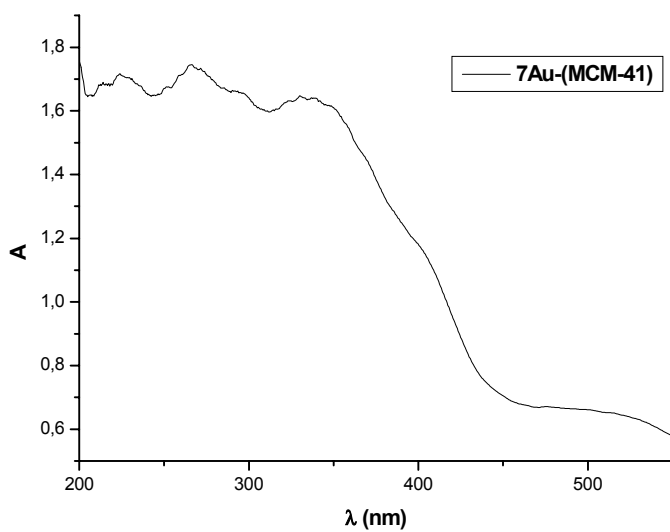
Supplementary Material UV-vis (DFTR) and FTIR spectra for complexes 7Au and 7Au-(MCM-41)



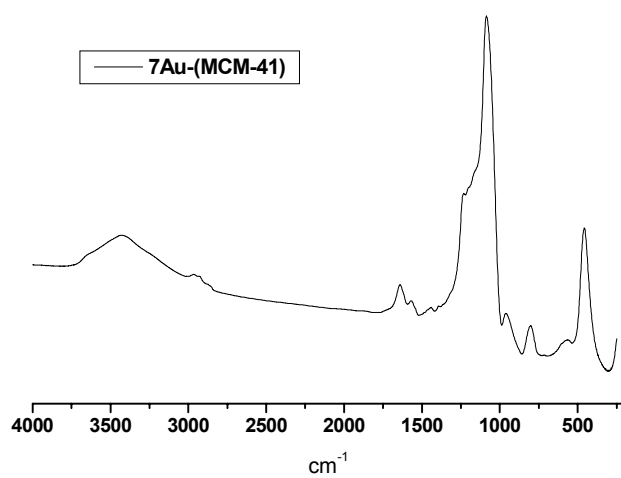
UV-vis spectrum for 7Au



FT-IR spectrum for 7Au



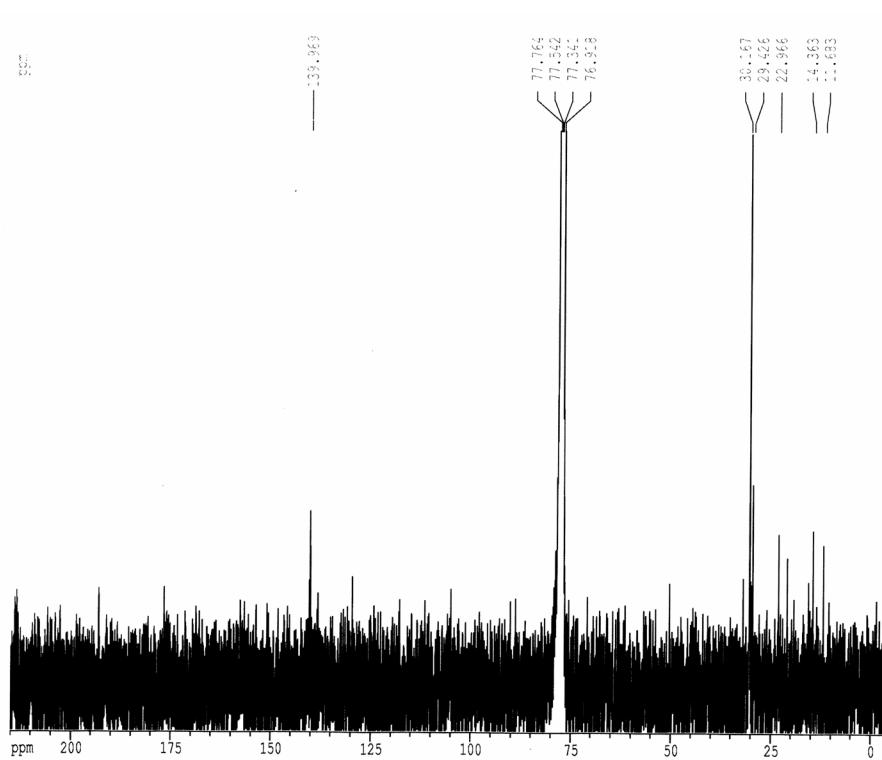
Reflectance diffuse spectrum for **7Au-(MCM-41)**

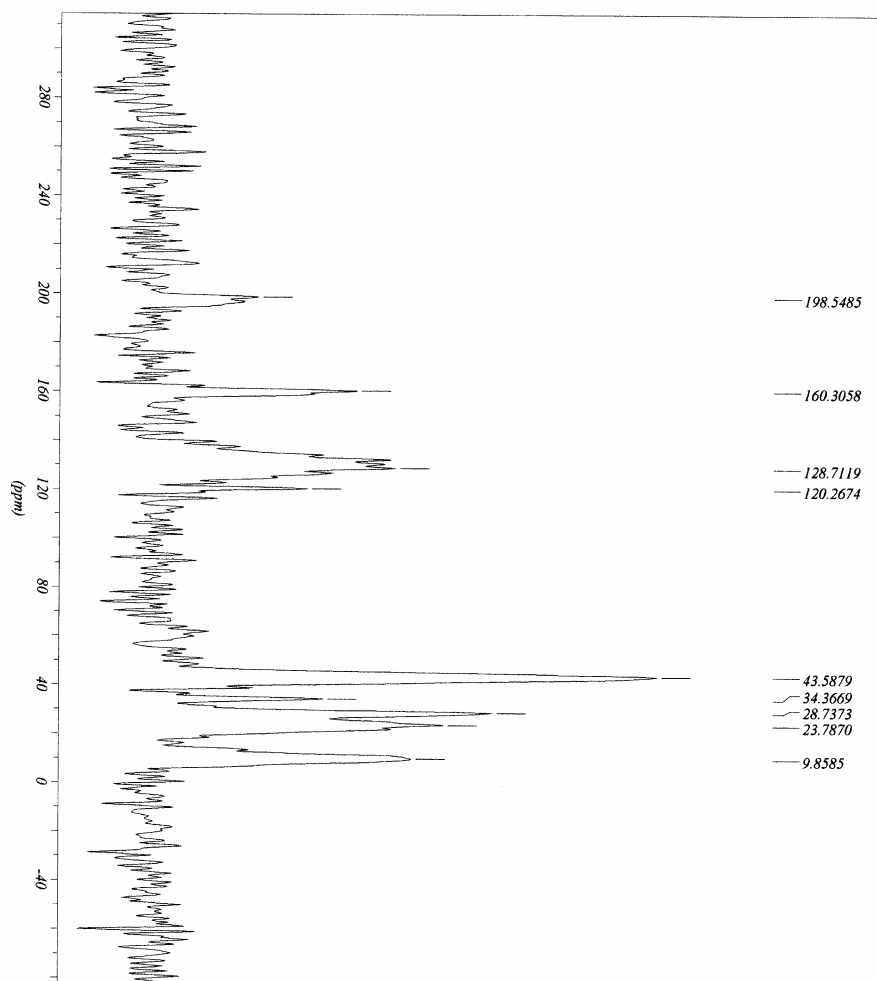


FT-IR spectrum for **7Au-(MCM-41)**

Supplemental Material

^{13}C NMR of 7 Au and 7Au- (MCM-41) complex





^{13}C NMR spectrum for 7Au-(MCM-41)